

112.4 - Trace Elements (wafer form)

These SRMs are for calibrating instruments and evaluating analytical techniques used to determine trace elements in inorganic matrices. NOTE: The nominal glass composition of SRMs 610 through 617 is 72% SiO₂, 12% CaO, 14% Na₂O, and 2% Al₂O₃.

PLEASE NOTE: The tables are presented to facilitate comparisons among a family of materials to help customers select the best SRM for their needs. For specific values and uncertainties, the certificate is the only official source.

SRM	610	611	612	613	614	615	616	617
Description	Trace Elements in Glass							
Unit of Issue	(4 wafers)							

Element (in mg/kg) Wafer Thickness (in mm) 3 and 1

Antimony (Sb)	415.3	415.3	34.9	34.9	(1.06)	(1.06)	0.078	0.078
Arsenic (As)	340	340	37.4	37.4				
Barium (Ba)	453	453	38.6	38.6				
Boron (B)	(351)	(351)	(32)	(32)	1.30	1.30	0.20	0.20
Cadmium (Cd)	244	244	29.9	29.9	(0.55)	(0.55)		
Cerium (Ce)			(39)	(39)				
Chromium (Cr)	415	415	35.0	35.0				
Cobalt (Co)	(390)	(390)	35.5	35.5	0.73	0.73		
Copper (Cu)	444	444	37.7	37.7	1.37	1.37	0.80	0.80
Dysprosium (Dy)			(35)	(35)				
Erbium (Er)			(39)	(39)				
Europium (Eu)			(36)	(36)	0.99	0.99		
Gadolinium (Gd)			(39)	(39)				
Gallium (Ga)					(1.3)	(1.3)	0.23	0.23
Gold (Au)	(25)	(25)	(5)	(5)	(0.5)	(0.5)	0.18	0.18

Element (in mg/kg) Wafer Thickness (in mm) 3 and 1

Iron (Fe)	458	458	51	51	13.3	13.3	11	11
Lanthanum (La)			(36)	(36)	0.83	0.83	0.034	0.034
Lead (Pb)	426	426	38.57	38.57	2.32	2.32	1.85	1.85
Lithium (Li)	(488)	(488)	(40)	(40)				
Manganese (Mn)	457	457	37.7	37.7				

In addition to the elements listed above, the glass SRMs contain the following 23 elements: Be, Bi, Cs, Cl, F, Ge, Hf, Hg, Li, Lu, Mg, Nb, P, Pr, S, Tb, Te, Tm, Sn, W, V, Y, and Zr.

- Certified values are normal font

- Reference values are italicized

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Neodymium (Nd)			(36)	(36)				
Nickel (Ni)	458.7	458.7	38.8	38.8	(0.95)	(0.95)		
Potassium (K)	(461)	(461)	(64)	(64)	30	30	29	29
Rubidium (Rb)	425.7	425.7	31.4	31.4	0.855	0.855	0.100	0.100
Samarium (Sm)			(39)	(39)				
Scandium (Sc)					0.59	0.59	0.026	0.026
Selenium (Se)	115.2	115.2	16.1	16.1				
Silver (Ag)	268	268	22.0	22.0	0.42	0.42		
Strontium (Sr)	515.5	515.5	78.4	78.4	45.8	45.8	41.72	41.72
Thallium (Tl)	61.8	61.8	15.7	15.7	0.269	0.269	0.0082	0.0082
Thorium (Th)	457.2	457.2	37.79	37.79	0.748	0.748	0.0252	0.0252

Element (in mg/kg) Wafer Thickness (in mm) 3 and 1

Titanium (Ti)	(437)	(437)	50.1	50.1	3.1	3.1	2.5	2.5
Uranium (U)	461.5	461.5	37.38	37.38	0.823	0.823	0.0721	0.0721
Ytterbium (Yb)			(42)	(42)				
Zinc (Zn)	(433)	(433)						

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